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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,488	02/18/2004	Andrew L. Van Brocklin	200315625-1	5677

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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
DETSCHEL, MARISSA	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/782,488	VAN BROCKLIN ET AL.	
	Examiner	Art Unit	
	Marissa J. Detschel	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8-17 and 26-30* is/are allowed.

6)☒ Claim(s) *1,2,18 and 31* is/are rejected.

7)☒ Claim(s) *3-7,9-12,19-25 and 32-36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, see section entitled "Objection to Specification and Claims" on page 11-12 of amendment filed May 11, 2006, with respect to the use of the phrase "Diffractive Light Device," have been fully considered and are persuasive. The objection of claims 1, 4, 8, 10, 13, 16-19, 23, 26, and 31 has been withdrawn. A Diffractive Light Device is understood by the Examiner to encompass a device where white light is allowed to enter a cavity or gap between reflective plates and undergo interference, resulting in light of a specific wavelength or color to emerge from the cavity. The color that emerges from the device can be selected by controlling the spacing of the gap. In view of this, the prior art as applied is in reference to a Fabry-Perot etalon device, which falls under these operational conditions as set forth in reference to a Diffractive Light Device.

Furthermore, applicant's arguments with respect to the prior art of Tucker (USPN 6,538,748) applied under 35 U.S.C. 102 to claims 1, 2, 18, and 31 filed May 11, 2006 have been fully considered but they are not persuasive. The applicant argues that the reference fails to include any system including a designer-specified gap value or a controller configured to calculate a voltage correction using such gap value as set forth in claim 1 or a system or a method including converting modulated light to an assumed gap value and comparing an assumed gap value to a designer-specified gap value, as set forth in claim 8 or claim 31.

The following equation applies to a Fabry-Perot etalon:

$m\lambda = 2dn$,

where m is a integer number, λ is the wavelength of the light produced by the etalon due to modulation, d is the spacing between the reflective plates of the etalon, and n in the refractive index of the material in the spacing between the reflective plates of the etalon. Therefore, there is a direct relation between the wavelength of the light produced by the etalon due to modulation and the spacing between the plates of the etalon. If the wavelength of the light produced is known, the spacing can be found, and vice versa. As set forth in the rejection below, the wavelength of the reference laser in Tucker's device represents a designer-specified gap value because of this relation between the spacing and the wavelength. The difference in wavelength between that of the reference laser and that produced by the etalon indicates a difference between a spacing of the etalon and that of the designer specified gap value. A controller adjusts the potential between the first and second surfaces of the etalon to adjust the distance between the fixed and movable mirrors to reduce any differences found in the wavelengths.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 2, 18, and 31 are rejected under 35 U.S.C. 102(a) as being anticipated by Tucker et al. (USPN 6,538,748).

In regards to claim 1, Tucker discloses a feedback-control circuit for calibration of a device comprising:

at least one diffractive light device (DLD) having a gap distance defined by opposing plates (13, 14, 213, 214) (column 3, lines 18-23);

The diffractive light device is understood by the Examiner to be any optical device having a gap distance defined by opposing plates. A Fabry Perot filter is an example of an optical device having a gap distance defined by opposing plates.

at least one sensor configured to convert light modulated by said DLD device into a light signal indicative of said gap (column 1, lines 22-29 and column 5, line 59 to column 6, line 8);

The spacing between the opposing plates of a Fabry-Perot device is directly related the device's resonant frequency (i.e. wavelength). The controller of Tucker's laser feedback circuit uses a method to determine the difference in wavelength between a reference laser and Fabry-Perot device. The wavelength measurement from the Fabry-Perot device is a direct measurement of the spacing between the opposing plates, and, thus, the controller of Tucker is configured to convert the light modulated by the Fabry-Perot into a light signal indicative of the gap spacing.

a controller configured to calculate a voltage correction value based on a difference between said gap as indicated by said light signal and a designer-specified gap value and being further configured to apply a corrected voltage corresponding to said voltage correction value to said DLD device (column 5, line 59 to column 6, line 8).

The wavelength of the reference laser in Tucker's device represents a designer-specified gap value, and the voltage correction value is indicated by the difference in wavelength between the Fabry-Perot device (i.e. gap as indicated by said light signal) and a reference laser wavelength (i.e. designer specified gap value, since wavelength value is indicative of a gap value in a Fabry-Perot device, as set forth above). A controller adjusts the potential between the first and second surfaces of the etalon to adjust the distance between the fixed and movable mirrors to reduce any differences found in the wavelengths.

Regarding claim 2, the sensor of Tucker is a photodiode. It would be inherent to use a photodiode in order to take wavelength measurements of the reference laser and the Fabry-Perot tunable laser.

In regards to claim 18, Tucker discloses a method of calibrating a diffractive light device (DLD), comprising:

placing first and second opposing plates in a separated position defined by an actual gap distance (column 3, lines 18-23);

The diffractive light device is understood by the Examiner to be any optical device having a gap distance defined by opposing plates. A Fabry Perot filter is an example of an optical device having a gap distance defined by opposing plates.

directing light onto said DLD device to modulate the light (column 5, lines 40-43);

A Fabry-Perot device can be converted to a tunable laser by introducing light from a source into the device. Due to the design of the Fabry-Perot device, the light is modulated based on the resonant frequency of the Fabry-Perot cavity as indicated by the spacing in the cavity.

converting modulated light to an assumed gap value (column 1, lines 22-29 and column 5, line 59 to column 6, line 8);

The spacing between the opposing plates of a Fabry-Perot device is directly related the device's resonant frequency (i.e. wavelength). The controller of Tucker's laser feedback circuit uses a method to determine the difference in wavelength between a reference laser and Fabry-Perot device. The wavelength measurement from the Fabry-Perot device is a direct measurement of the spacing between the opposing

plates, and, thus, the controller of Tucker is configured to convert the light modulated by the Fabry-Perot into a light signal indicative of the gap spacing.

comparing said assumed gap value to a designer specified gap value; and

adjusting said assumed gap distance by a distance proportional to a difference between said assumed gap value and said designer-specified gap value (column 5, line 59 to column 6, line 8).

The wavelength of the reference laser in Tucker's device represents a designer-specified gap value, and the voltage correction value is indicated by the difference in wavelength between the Fabry-Perot device (i.e. gap as indicated by said light signal) and a reference laser wavelength (i.e. designer specified gap value, since wavelength value is indicative of a gap value in a Fabry-Perot device, as set forth above). A controller adjusts the potential between the first and second surfaces of the etalon to adjust the distance between the fixed and movable mirrors to reduce any differences found in the wavelengths.

In regards to claim 31, Tucker discloses a DLD system comprising:

means for diffracting light based on actual gap distance (column 3, lines 18-23);

The diffractive light device is understood by the Examiner to be any optical device having a gap distance defined by opposing plates. A Fabry Perot filter is an example of an optical device having a gap distance defined by opposing plates.

means for converting detected light values to assume gap values (column 1, lines 22-29 and column 5, line 59 to column 6, line 8);

The spacing between the opposing plates of a Fabry-Perot device is directly related the device's resonant frequency (i.e. wavelength). The controller of Tucker's laser feedback circuit uses a method to determine the difference in wavelength between a reference laser and Fabry-Perot device. The wavelength measurement from the Fabry-Perot device is a direct measurement of the spacing between the opposing plates, and, thus, the controller of Tucker is configured to convert the light modulated by the Fabry-Perot into a light signal indicative of the gap spacing.

means for comparing said assumed gap values to designer-specified gap values; and

means for adjusting said actual gap distance to minimize the distance between said assume gap values and said designer specified gap values (column 5, line 59 to column 6, line 8).

The wavelength of the reference laser in Tucker's device represents a designer-specified gap value, and the voltage correction value is indicated by the difference in wavelength between the Fabry-Perot device (i.e. gap as indicated by said light signal) and a reference laser wavelength (i.e. designer specified gap value, since wavelength value is indicative of a gap value in a Fabry-Perot device, as set forth above). A controller adjusts the potential between the first and second surfaces of the etalon to adjust the distance between the fixed and movable mirrors to reduce any differences found in the wavelengths.

Allowable Subject Matter

Claim 3, 6, 7, 20-22, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 8, 10, 13, 16, 17, 23, 26, and 30 are objected to based on the minor informalities presented in this office action, but would be allowable if rewritten to overcome these minor informalities.

Claims 9, 11, and 12, which are dependent from claim 8, are also objected to based on the minor informalities of claim 8, but would be allowable if the minor informalities of claim 8 are overcome.

Claims 14 and 15, which are dependent from claim 12, are also objected to based on the minor informalities of claim 12, but would be allowable if the minor informalities of claim 12 are overcome.

Claims 27-29, which are dependent from claim 26, are also objected to based on the minor informalities of claim 26, but would be allowable if the minor informalities of claim 26 are overcome.

Claim 4, 5, 19, 25, and 32-34 are objected to as being dependent upon a rejected base claim and based on the minor informalities as presented in this office action, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and, furthermore, rewritten to overcome these minor informalities.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 3, the prior art of record, taken alone or in combination, fails to disclose or render obvious a controller in a feedback-control circuit for calibration of a diffractive light device comprising a gap value converter having an analog-to-digital converter and a static lookup table, in combination with the rest of the limitations of claim 3.

As to claim 4, the prior art of record, taken alone or in combination, fails to disclose or render obvious a controller in a feedback-control circuit for calibration of a diffractive light device comprising an analog-to-digital converter, a color vector generator, and a static lookup table, in combination with the rest of the limitations of claim 4.

As to claim 5, the prior art of record, taken alone or in combination, fails to disclose or render obvious a controller in a feedback-control circuit for calibration of a

diffractive light device comprising an amplifier coupled to a static lookup table, in combination with the rest of the limitations of claim 5.

As to claim 8, the prior art of record, taken alone or in combination, fails to disclose or render obvious a feedback-control circuit for calibration of a set of diffractive light devices comprising a designer-specified gap value table with a stored plurality of designer-specified gap values corresponding to gap distances in the diffractive light devices, in combination with the rest of the limitations of claim 8.

As to claim 13, the prior art of record, taken alone or in combination, fails to disclose or render obvious a diffractive light device system comprising a feedback-control circuit that includes a calibration array with an operational lookup table coupled to the circuit that couples designer-specified gap values and voltage correction values, and stores these values, in combination with the rest of the limitations of claim 13.

As to claim 19, the prior art of record, taken alone or in combination, fails to disclose or render obvious placing first and second plates in a separated position based on an initial voltage corresponding to a designer-specified gap value in a method for calibrating a diffractive light device, in combination with the rest of the limitations of claim 19.

As to claim 20, the prior art of record, taken alone or in combination, fails to disclose or render obvious the method of calibrating a diffractive light device comprising directing light modulated by a diffractive light device through a color filter and onto a sensor, and converting the sensor output into a digital signal representing an assumed gap value for the device, in combination with the rest of the limitations of claim 20.

As to claim 26, the prior art of record, taken alone or in combination, fails to disclose or render obvious the method of storing and correlating voltage correction values and designer-specified gap functions on an operational lookup table in a method for calibrating a diffractive light device array, in combination with the rest of the limitations of claim 26.

As to claim 32, the prior art of record, taken alone or in combination, fails to disclose or render obvious a diffractive light device system comprising means for storing a designer-specified gap value and a voltage correction value based on the difference between a designer-specified gap value and an assumed gap value, in combination with the rest of the limitations of claim 32.

Pertinent Prior Art

The prior art made of record, but not relied upon is considered pertinent to applicant's disclosure. The prior art of record is Smith et al. (USPN 6,707,230). Smith discloses a closed loop motion control system for use in a sensor that senses a displacement in a device utilizing a feedback loop to control a voltage applied to an actuator to vary the displacement based on differences calculated between a desired set-point and the measurement by the sensor of the displacement in the device. The sensor can be an optical sensor that measures a Fabry-Perot intensity.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa J. Detschel whose telephone number is 571-272-2716. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Marissa J. Detschel
June 28, 2006
MJD

HWA (ANDREW) LEE
PRIMARY EXAMINER